

**HIGH SWITCHING SPEED TWO MASK SCHOTTKY DIODE
WITH HIGH FIELD BREAKDOWN**

Abstract of the Invention

5 A power Schottky rectifier device and its fabrication method are disclosed. The method comprises the following steps: First, a semiconductor substrate having a relatively heavily doped n+ doped layer and a lightly doped is provided. A buried p region is then formed in the epi layer by ion implantation. Afterward, a first oxide layer and a
10 nitride layer are then successively formed on the epi layer. The result structure is then patterned to form trenches. Subsequently, a thermal oxidation step is performed to recover etch damage. A wet etch is then performed to remove the thin oxide layer in the trench to expose the silicon in the sidewall. After that, a silicidation process is then performed
15 to form silicide layer on the n-epi-layer in the trenches. After a removal of un-reacted metal layer, a top metal layer is then formed on the silicide layer and on the first oxide layer or nitride layer. The top metal layer on the termination region portion is then patterned to define anode. Finally, after backside layers formed on the rear surface of the substrate are
20 removed, another cathode layer is formed on the rear surface.